| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/695,755 | 10/24/2000 | Michael A. Nelson | CROSS1400-1 | 2697 |

25094          7590          03/15/2004

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| EXAMINER |
|---|
| BARANYAI, LAWRENCE |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2665 | 5 |

DATE MAILED: 03/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C  (Rev. 10/03)

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>24 October 2000</u>.

2a)☐ This action is **FINAL**.      2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-23* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *4*.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

# DETAILED ACTION

## Information Disclosure Statement

An initialed and dated copy of Applicant's IDS form 1449, Paper No. 4, is

attached to the instant Office action.

## Claim Rejections - 35 USC § 102

1.      The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action.

A person shall be entitled to a patent unless:

> (a) The invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

> (b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.      Claims 1, 3, 7-9, 11-14, 19-20 and 23 are rejected under 35 U.S.C. 102(b) as

being anticipated by Gallagher et al. (US 5,619,497).

Regarding claims 1, 9, 19, 20, 23, Gallagher discloses a method and system

comprising: receiving a plurality of frames (col. 5, 27-31, col. 18, 30-35); storing the

frames in a receive buffer (col. 20, 46-53: Frame Data FIFO), wherein the receive buffer

is configured to be accessed in a first-in-first-out fashion (col. 20, 46-53: Frame Data

FIFO); storing header information corresponding to each of the frames in a header

storage (col. 20, 46-53: Frame Header FIFO), wherein the header storage is configured

to provide access to the header information in the same order as the frames (col. 20,
line 40 – col. 21 line 45: Receive Frame Manager controls movement of frame data and
transfer of such data in response to the receipt of the respective frame header by the
Receive Frame Manager. Therefore access to header information is provided in the
same order as the frame data); retrieving header information from the header storage,
wherein the header information corresponds to a first frame (col. 24, 51-52: D_ID, is
located in the table. D_ID is destination ID from the header per col. 6 lines 29-66);
making a routing decision for the first frame based upon the header information (col. 24,
49-59: an identifier of the output port associated with the located D_ID table entry is
read from the table by the control circuit 450); retrieving the first frame from the receive
buffer (col. 24, 49-50: control circuit 450 receives the processed frame); and routing the
first frame based upon the routing decision (col. 24, 54-59 and fig. 16: the control circuit
450 positions the switch 458 to connect to the output terminal 462 associated with the
port on which the processed frame is to be transmitted).

3.      Regarding claim 3,  Gallagher teaches the limitation wherein routing the first
frame comprises transmitting the first frame to the transmit buffer of a destination
determined by the routing decision (col. 24 lines 49-67 and fig. 16 control circuit routes
frame to selected transmit FIFO (buffer) 354 based on routing decision as noted for
claim 1.

4.      Regarding claims 7, 12, 13 and 14, Gallagher teaches the limitation wherein the
receive buffer is a First-in-first-out (FIFO) buffer having a head position and a tail
position, wherein entries are written to the tail position and are promoted through the

FIFO buffer to the head position, and wherein retrieving the first frame from the receive

butter comprises reading the frame at the head position (fig. 7b, fig. 8, and col. 12, 28-

31: first frame 50a is stored first, head, then 50b, 50f, 50c, 50d and last data frame 50e

is stored last, tail for FIFO and Memory, first element/location reused - circular).

5.      Regarding claims 8 and 11, Gallagher teaches the limitation further comprising

providing a bypass circuit coupled to the header storage, wherein if no header

information is available at the head of the header storage, the bypass circuit makes

next-received header information immediately available (col. 23, 38-54: Frame Header

FIFOs send empty/not empty signals indicative of whether frame header has been

received by respective FIFO; if yes, access that FIFO, conversely if not, then not).

### Claim Rejections - 35 USC § 103

1.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art
> are such that the subject matter as a whole would have been obvious at the time the invention was made to
> a person having ordinary skill in the art to which said subject matter pertains.  Patentability shall not be
> negatived by the manner in which the invention was made.

2.      Claims 2, 21, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Gallagher et al. (US 5,619,497). Gallagher teaches a method and system of routing

frame data using the frame header as noted for claims 1, 3, 7-9, 11-14, 19-20 and 23

above.

Regarding claims 2, 21, 22 Gallagher teaches the control circuit 450 may include a buffer (col. 24, 32-33). Gallagher does not explicitly teach the limitation to allow a routing decision to be made on a frame while the preceding frame is being routed; or wherein the first header information corresponds to a first frame in the receive buffer and wherein the transfer logic is configured to make the routing decision for the first frame prior to the first frame reaching a head position in the receive buffer; or wherein the first header information corresponds to a first frame in the receive buffer and wherein the transmit logic is configured to make the routing decision for the first frame while a preceding frame is being transferred from the receive buffer.

Pipelining is a well-known technique to improve performance to those skilled in the art of communications, as suggested for example, by Viswanadham (col. 6 12-40: overlap/pipeline to improve performance). One skilled in the art of communications would see the advantage of using the buffer in the control circuit to allow the decision making and routing to be pipelined so that the header can be processed ahead of the data frame while the preceding frame is being transferred to reduce the latency of the system and improve performance. It would have been obvious for one of ordinary skill in the art at the time of the invention to apply pipelining techniques to the system of Gallagher, with the motivation being to arrive at a system that improves performance.

3.      Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher et al. (US 5,619,497) as applied above to claims 1-3, 7-9, 11-14, and 19-23, and, in further view of Viswanadham et al. (US 6,424,659). Gallagher teaches a method and system of routing frame data using the frame header as noted for the claims above.

Gallagher does not teach the limitation further comprising maintaining a timer corresponding to each header in the header storage.

Viswanadham, in the analogous field of communications, teaches the use of a timer corresponding to each header in the header storage (col. 16, line 30 – 19 line 35: Time to Live, TTL, captured in L3 Header Memory, TTL is checked, TTL error flag is generated if TTL is less than a threshold).

One skilled in the art of communications would recognize the advantage of including a timer to identify stale data, as is normally the case in the art of data communications. It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Viswanadham, to apply the timer feature to the system of Gallagher, with the motivation being to arrive at a system that improves performance by providing a timer to identify stale data.

4.      Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gallagher et al. and Viswanadham et al. as applied to claims 1-4, 7-9, 11-14, and 19-23 above, and in further view of Comer (U). Gallagher teaches a method and system of routing frame data using the frame header as noted for the claims above.  Viswanadham teaches the use of a timer and to generate an error if the TTL value crosses a threshold. These references do not teach the limitation of discarding the frame corresponding to the header information if the timer corresponding to the retrieved header information exceeds the predetermined maximum value.

Comer, in the analogous field of communications, teaches the limitation of discarding the frame corresponding to the header information if the timer corresponding

to the retrieved header information exceeds the predetermined maximum value, as is

normally the case in the art of data communications (p. 99).

One skilled in the art of communications would recognize the advantage of a

discard of the data if the timer crosses a threshold, as is normally the case in the art of

data communications. It would have been obvious for one of ordinary skill in the art at

the time of the invention, when presented with the work of Comer, to apply the discard

feature to the system of Gallagher and Viswanadham, with the motivation being to

arrive at a system that improves performance by discarding stale data.

5.     Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Gallagher et al. and Viswanadham et al. and Comer as applied to claims 1-5, 7-9, 11-

14, and 19-23  above, and in further view of Darnell et al. (US 6,317,415). Gallagher

teaches a method and system of routing frame data using the frame header as noted for

the claims above.  Viswanadham teaches the use of a timer and to generate an error if

the TTL value crosses a threshold as noted for the claims above. Comer teaches

discarding the frame if the TTL exceeds a predetermined value. These references do

not teach the limitation further comprising snooping on received frames to identify the

header information corresponding to each of the frames.

Darnell, in the analogous field of communications, teaches the use of a snoop

circuit for snooping on received frames to identify the header information corresponding

to each of the frames (col. 5, 20-43 and fig. 5 Snooper 120: IRC 40 snoops on the data

bus to determine the frame pointer value and the header information of the received

packet).

One skilled in the art of communications would recognize the advantage of a

snoop circuit to identify header information efficiently. It would have been obvious for

one of ordinary skill in the art at the time of the invention, when presented with the work

of Darnell, to apply the snooper to the system of Gallagher, Viswanadham and Comer,

with the motivation being to arrive at a system that improves performance by monitoring

the data in parallel with other operations to determine the header.

6.      Regarding claims 15-18, Viswanadham teaches the use of a timer for the frame

data and frame header buffers (col. 17, 25-44)

### Citation of Relevant Prior Art

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Nichols et al. (US 4,977,582) and Sang et al. (US 6,577,636)

disclose routing/forwarding systems that include storing frame header information.

### Examiner Information

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Lawrence Baranyai whose telephone number is (703)

305-8707.  The examiner can normally be reached on Monday-Thursday: 6:30am-

5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Huy Vu can be reached on (703) 308-6602.  The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system.  Status information for published

applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

lb

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